

DOCKET NO: 248556US55CONT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
DOMINIQUE LOUBINOX : EXAMINER: AFTERGUT, J.
SERIAL NO: 10/068,857 :
FILED: FEBRUARY 11, 2002 : GROUP ART UNIT: 1733
FOR: METHOD AND APPARATUS FOR :
THE MANUFACTURE OF COMPOSITE
SHEETS

APPEAL BRIEF UNDER 37 C.F.R. §41.37

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Responsive to the Office Action dated August 27, 2007 and further to the Notice of Appeal filed on February 27, 2008, Appellant requests review of the rejections in the above-identified application by the Board of Patent Appeals and Interferences.

I. REAL PARTY IN INTEREST

The real party in interest is Saint-Gobain Recherche of France.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF THE CLAIMS

Claims 30-31, 44, 47, 52 and 54-59 are pending in the application. Claims 1-29, 32-43, 45-46, 48-51 and 53 are canceled claims. The rejection of Claims 30-31, 44, 47, 52 and 54-59 is appealed.

IV. STATUS OF THE AMENDMENTS

The Amendment filed on June 18, 2007 was entered and considered subsequent to the filing of an RCE on July 16, 2007.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Independent Claim 30 is drawn to a method of manufacturing a composite sheet. The composite sheet of the claimed invention is described in the paragraph bridging pages 2 and 3 and in the first full paragraph on page 3. The claimed method includes steps of providing bundles of threads, combining bundles of threads and heating the combined bundles of threads to form a solid composite sheet. The steps of the claimed method are described on page 3, line 11 – page 4, line 28; page 6, lines 5-17; page 6, line 36 – page 7, line 11; page 9, lines 9-32; and Figures 1 and 2 which show the laying of bundles of threads. The method is carried out to form a solid composite sheet that contains solely first and second bundles of parallel threads. This aspect of the invention is described on page 3, lines 11-20.

VI. GROUNDS OF REJECTION

- A. **Claims 30-31, 44, 47, 52 and 54-59 are rejected as obvious under the meaning 35 U.S.C. §103(a) over Middelman (US 5,269,863) in combination with one or more of O'Connor (US 4,800,113); NASA (“Solventless Fabrication of Reinforced Composites”); Curzio (US 4,539,249); U.K. Patent 2,190,041 (UK ‘041); Vane (US 4,445,693); and Matsuo (US 5,989,710) (see section no. 2 on pages 2-7 of the Office Action of July 13, 2006).**

The Office cites Middelman as a primary reference for describing a method for making a composite sheet that includes providing and combining different bundles of thread and impregnating the combined bundles with a matrix. The Office combines Middelman with one or more secondary references from the group of O'Connor, NASA, Curzio, UK '041, Vane and Matsuo for the description of the use of a thread that includes a blend of thermoplastic organic fiber and a reinforcing fiber to avoid the disadvantages of the impregnation step described in the primary reference (see the paragraph bridging pages 3 and 4 of the Office Action of August 27, 2007). The Office asserts that it would be obvious to modify Middelman in the manner taught by the secondary references to arrive at the presently claimed invention.

VII. ARGUMENT

The Office rejected the present claims as obvious for the reason that it would be obvious to modify the method of the primary reference, Middelman, by replacing a step of impregnating an assembly of bundled threads with a step of assembling bundled threads in a manner such that a composite sheet can be formed in the absence of the impregnation step of Middelman (see the "Response to Arguments" section on pages 3-5 of the August 27, 2007 Office Action). Appellant submits that the Office's basis for rejecting the claims is contrary to the disclosure of the Middelman reference and contrary to USPTO administrative procedure and should thus be overturned.

Present independent Claim 30 is drawn to a method of manufacturing a composite sheet. The composite sheet is one that must include "solely the first bundle of parallel threads, the lap of threads, and the second bundle of parallel threads" (see the last two lines of Claim 30). This requirement of the claimed method makes it clear that the composite sheet

of the invention does not include any materials other than the materials provided in the first and second bundle of threads and the lap of threads.

In contrast, Middelman involves a step of impregnating an assembly of threads with a matrix material. The Office admits that this feature of Middelman is different from the appealed claims (see the paragraph bridging pages 3 and 4 of the August 27, 2007 Office Action):

To begin with, while it is admitted that Middelman employed a resin impregnation operation, the basis for the obviousness rejection is essentially that one viewing the prior art as a whole would have been deterred from impregnation in the usual sense as one would have desired to employ a matrix fiber which was a thermoplastic material in the operation in order to avoid the identified disadvantages with impregnation as established by the references to any one of O'Connor, NASA tech brief entitled "Solventless Fabrication of Reinforced Composites", U.K. Patent 2,190,041 or Curzio.

Appellant submits that the modification of Middelman in the manner that is asserted by the Office to be obvious would render the primary reference inoperable and/or would change the principle of operation of the Middelman method.

As admitted by the Office, Middelman employs a resin impregnation step. Deleting the resin impregnation step from Middelman would change the principle of operation of the Middelman method. For example, Middelman describes the method by way of Figure 1 of the Middelman patent. Figure 1 is reproduced below for convenience:

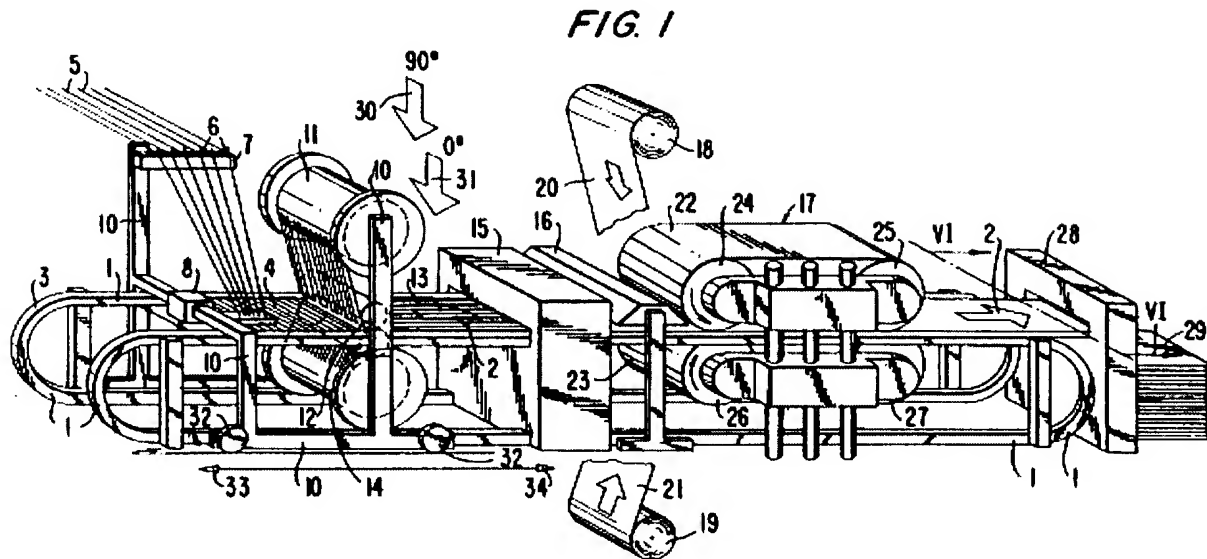


Figure 1 above depicts a process in which threads identified by reference numerals 5 and 13 are laid in a continuous manner on a belt. The direction of movement of the belt is shown by the arrow identified as reference numeral 2. The assembled threads pass through a metering unit (identified as reference numeral 15) which dispenses a liquid thermosetting synthetic material onto the assembly of threads (see column 8, lines 39-46 and column 6, lines 33-38).

The Office's assertion that it would be obvious to modify the Middelman process to delete the impregnation step is contradictory to the express disclosure of the Middelman patent. There is no suggestion or disclosure anywhere in the Middelman patent that removal of the impregnation step is desirable or even possible. Appellant submits that modifying the Middelman process as asserted by the Office would substantially change the principle of operation of the Middelman process. Likewise deleting the impregnation step from the Middelman process would provide an unbonded assembly of threads wholly unsuitable for the purpose of a printed wire board (see the title of Middelman).

Appellant draws the Board's attention to M.P.E.P. §2143.02 (VI) which states, in part:

If the proposed modification or combination of the prior art would change the principle of operation of the prior art

invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.

Appellant further draws the Office's attention to M.P.E.P. §2145 (III) which states, in part:

However, the claimed combination cannot change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. See M.P.E.P. §2143.01.

The Office put forth an argument that it would be obvious to modify Middelman in a manner that would change the principle of operation by which the reference describes the manufacture of a printed wire board. Middelman requires the inclusion of an impregnation step whereby an assembly of threads is impregnated with a liquid matrix. Because the present claims require that the composite sheet formed by the claimed method contains solely first and second bundles of threads and a lap of threads, one of ordinary skill in the art would necessarily have to carry out Middelman without the impregnation step in order to arrive at the presently claimed invention.

The present claims describe a process that is different from the Middelman process and, in fact, is mutually exclusive of the Middelman process. Middelman includes a step of impregnating a thread assembly with a liquid matrix medium. The presently claimed method forms a composite sheet that contains only first and second bundles of thread and a lap of thread and thus excludes the matrix added by the impregnating of the Middelman process.

In order to rationalize the modification of Middelman the Office asserts that "one viewing the totality of the record would have understood that there were advantages to employing a blended thread of both thermoplastic matrix filaments and glass reinforcing filaments as such would have overcome the disadvantages of impregnation with a resin." It appears that the Office is generally alleging that one of ordinary skill in the art would have been capable of modifying Middelman in the manner alleged by the Office to arrive at the presently claimed invention. However, as explained above, such a modification would

change the principle of operation of the Middelman process and render the Middelman process inoperable because omission of the Middelman impregnation step would provide an assembly of threads without any matrix structure.

Appellant submits that the rejection is not sustainable and should be overturned at least because (i) the modification asserted by the obvious as obvious would (i) change the principle of operation of the primary reference and further would (ii) render the process of the primary reference inoperable.


For the reasons discussed above, Appellant respectfully requests the Board overturn the rejections of reference and compel the Examiner to allow all now-pending claims.

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VIII. CLAIMS APPENDIX

Claims 1-29 (Canceled).

Claim 30. A method of manufacturing a composite sheet comprising:

providing a first bundle of parallel threads moving unidirectionally in a first direction;

placing a lap of thread(s) on a surface of the moving bundle of threads with a weft insertion carriage, wherein the lap of thread(s) is a single layer of continuous thread(s) oriented in a second direction that is transverse to the first direction, to provide a first combination of threads having a first layer comprising the moving bundle of threads and a second layer comprising the lap of thread(s);

combining the first combination of threads with a second bundle of parallel threads moving in the first direction to provide a second combination of threads having, in the following order, a first layer comprising the moving bundle of threads, a second layer comprising the lap of thread(s) and a third layer comprising the second bundle of parallel threads, wherein the threads of the first layer, second layer, and third layer are separate and unconnected from threads in any other layer,

wherein the second combination of threads comprises at least 50% by weight of co-blended threads consisting essentially of intimately mixed glass filaments and filaments of at least one thermoplastic organic material; then

heating the second combination of threads, optionally applying pressure to the second combination of threads, and cooling the second combination of threads to provide a solid composite sheet; and

collecting the solid composite sheet,

wherein at least one of the first bundle of parallel threads, the second bundle of parallel threads, or the lap of threads comprises the at least one thermoplastic organic

material, and at least one reinforcing material, and at least one of the first bundle of parallel threads, the second bundle of parallel threads, or the lap of threads comprises at least two materials having different melting points,

wherein the combination of threads comprises at least 10 percent of the thermoplastic organic material, and

wherein the composite sheet comprises solely the first bundle of parallel threads, the lap of threads, and the second bundle of parallel threads.

Claim 31. The method according to claim 30, further comprising introducing into the combination of threads, introducing into the second combination of threads, placing on the surface of the combination of threads, or placing on the surface of the second combination of threads one or more additional materials to provide additional reinforcement, improve the mechanical properties, protect against electromagnetic radiation, improve molding capacity, improve surface properties, or reduce the weight of the composite sheet.

Claims 32-43 (Canceled).

Claim 44. The method of claim 30, comprising applying pressure to the combination of threads after heating.

Claim 45-46 (Canceled).

Claim 47. The method of Claim 30, wherein the lap of threads consists of continuous threads of organic material.

Claims 48-51 (Canceled).

Claim 52. The method of Claim 30, wherein the composite sheet comprises polypropylene and glass filaments in perpendicular orientation.

Claim 53 (Canceled):

Claim 54. The method of Claim 30, wherein each of the moving bundle of threads, the lap of threads, and the second bundle of parallel threads are continuous threads.

Claim 55. The method of Claim 30, wherein the combination of threads comprises between 50 and 80% of reinforcing material.

Claim 56. The method of Claim 30, wherein the composite sheet has a thickness of between a few tenths of a millimeter and approximately 2 mm.

Claim 57. The method of Claim 30, wherein the composite sheet has a thickness of from 0.7 to 2 mm.

Claim 58. The method of Claim 30, wherein the co-blended threads consist of threads of the glass filaments and the filaments of the at least one thermoplastic organic material.

Claim 59. The method of Claim 30, wherein the first bundle of parallel threads is a single layer of continuous threads.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.